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ABSTRACT

The key factor to the de facto inequality typically maintained in America's city school system is found to be the teacher assignment system. Data from 69 cities are examined to determine whether this meant a systematic tendency to assign Black teachers to Black students. Poor and non-white students are kept at least partially segregated, and the more experiences and more verbally able white teachers are assigned to schools attended by the less disadvantaged white children. There is a strong regional dimension to this inequality and discrimination found existing in the school systems. Effective discrimination rises more or less continously as the South is approached, reaching a maximum level of complete segregation of students, with all Black students taught by Black teachers, and all white students taught by white teachers. Outside of the South, there is also some evidence that racial integration in the schools is reduced as the percentage of Black students, and especially of Black teachers, increases. Black students are then more likely to be segregated, and less likely to be assigned to white teachers. The relationship of effective pupil discrimination to pupil segregation and to a discriminatory teacher assignment is analyzed in a technical appendix. (RJ)

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RACIAL BIAS IN THE ALLOCATION OF TEACHERS IN SIXTY-NINE URBAN ELEMENTARY SCHOOL SYSTEMS

In an earlier paper, "An Empirical Analysis of Economic and Racial Bias in the Distribution of Educational Resources in Nine Large American Cities" (C.S.S.O.S. Report Number 47), evidence was presented that schools in big city neighborhoods made up largely of non-whites or of low-income families are assigned teachers who are paid less, have less experience, and score lower on verbal ability tests than those assigned to white middle-class neighborhoods in the same cities. This inequality exists within the city school systems studied, despite a formal commitment by these city school administrations to provide equal educational resources for all children in their jurisdictions.

The key to the de facto inequality which actually exists in these cities was found to be the teacher assignment system. Typically, experienced teachers are permitted some choice in their assignments. And, most commonly, this choice is exercised to obtain a transfer from a slum school, or one in which there is a high percentage of non-white students, to a white middle-class school.

There is, of course, a built-in racial bias in this teacher assignment system. It permits the experienced white teachers to express their own racial prejudices by transferring to white schools. Even when the white teacher is free of prejudice, and simply wishes to teach in a middle-class school, the relatively small percentage of non-whites in such schools makes it likely that the transfer from a slum to a middle-class environment will, in fact, be a transfer to a white student body.

Thus, the black student is likely to be taught either by less experienced whites, or by black teachers. Black teachers generally have less experience than white teachers, are not motivated by racial prejudice to seek transfer to white schools, and sometimes face racial discrimination by administrators and others when they do seek such transfers.

In the empirical study of nine large cities referred to above (C.S.S.O.S. Report Number 47), the assignment of black teachers to black students was the crucial factor in understanding the discriminatory workings of the teacher assignment system (far more important than, say, any tendency for less experienced white teachers to be assigned to non-white students). Black teachers had less experience, and thus tended to be paid less. They also scored much lower on a verbal ability test.

Apart from the understanding it gives of the process by which educational resources are allocated unequally in large American cities, the analysis of the racial assignment of teachers is also interesting for the light it sheds on the sincerity of the typical (or, at least, the typical non-Southern) city school system's claim that the segregation of pupils reflects racially separate housing patterns, rather than any official segregationist or discriminatory tendencies. In this view, the only way to have racial integration of schools without housing integration would be to bus children into districts of a different racial composition. Against this solution it is argued that the costs of bussing are unacceptable: the children's spare time should be used for homework or play rather than being spent in riding a bus; they should be able to come home for lunch; they should have an opportunity to play with their class-

mates rather than being carried promptly back to their neighborhoods, and so forth. However, none of these arguments apply to teachers. It is assumed that city employees are capable of bearing the stresses and strains of commuting on the municipal transportation system. Upper-class districts of our cities are staffed with policemen, firemen, sanitation workers, and the like, all of whom have to "bus in" from working-class districts. Thus, the extent to which teachers are permitted to be segregated also becomes a useful index of the truth of the city's assertion that student segregation is unintentional.

I. Data on both the segregation of pupils and the racial assignment of teachers are now available for all the public elementary schools in a large number of cities from the U.S. Civil Rights Commission. These data were transformed to obtain the summary measures shown in Table 1.

Table 1 gives the extent of pupil segregation, the tendency to assign black teachers to black students, and the resulting effective pupil discrimination against black students (defined as the difference between the probability of a black child's having a white teacher and that of a white child's having a white teacher) for sixty-nine American cities.

The relationship of this effective pupil discrimination to pupil segregation and to a discriminatory teacher assignment rule requires some explanation.[1] In order for a black student to have less chance of getting a white teacher, two conditions must be fulfilled: there must be a tendency to assign black teachers to predominantly black schools, and there must be some segregation of pupils along racial

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[1] This relationship is analyzed in greater detail in a technical appendix at the end of this paper.

Table 1

Racial Segregation of Students and Racial Bias in the Assignment of Teachers in Public Elementary Schools in 69 American Cities

	S	b	D	E	% Black Teachers / % Black Students	Probability of a Black Student's Getting a White Teacher
A. Region						
Deep South	.969	1.004	.972			
South	.924	.926	.855			
Southwest	.805	.864	.739			
Border	.780	.790	.615			
North	.637	.511	.331			
"Deep North"	.568	.281	.182			
B. % Black Students (non-Southern Schools)						
1 - 10	.341	.135	.052	.402	.331	.937
11 - 30	.675	.390	.283	.821	.497	.681
31 - 50	.625	.487	.321	.959	.501	.607
51 - 70	.766	.881	.680	1.022	.863	.203
C. 69-City Average						
	.650	.485	.349	.845	.558	.593

Source: Unpublished worksheets of the U.S. Civil Rights Commission, Washington, D.C. Cities weighted by elementary school populations to obtain averages in each case.

lines (without racial segregation there would be no predominantly black classes to which the city could assign its black teachers). The extent of effective pupil discrimination will then be a function of the degree of pupil segregation and of discrimination in teacher assignment.

This point can perhaps be seen more clearly when expressed in quantitative terms: let a measure of pupil segregation, the difference between the proportion of white children in a class attended by the average white child and the proportion of white children in a class attended by the average black child, be denoted as S. Then let white teachers be assigned to students on the basis of the racial composition of class according to a linear decision rule: $BT = a + bBS$. Effective pupil discrimination, D, will be equal to the product of b and s ($D = bS$).

Column 1 in Table 1 is a measure of S. Effective pupil discrimination, D, as defined above, is given in Column 3. b, the teacher assignment rule, was measured to a linear approximation by taking the ratio of D to S (column 2).

The results show that the partial racial segregation of teachers found in the nine-city sample continues to hold when the entire elementary school systems of sixty-nine cities are examined. Moreover, if the racial differences in verbal ability and experience which were found in the nine-city sample are typical of these sixty-nine cities, further evidence of discrimination in allocating educational resources would be afforded. The sixty-nine city study thus permits much more

analysis of inter-city variations in discrimination and segregation, and sheds further light on the problem of educational inequality in urban schools.

The first, and perhaps most important observation one may make here is the strong regional influence on segregation and discrimination (see Table 1A). Cities in or near the South typically have a maximum level of both: there is no significant variation in segregation and discrimination within this regional category. What is somewhat more interesting (because it is somewhat unexpected) is the apparent tendency for this regional influence to extend far beyond the area of the traditional South. Table gives average values of S, b, and D for six regions: Deep South, Other South, Southwest, Border, Other North, and "Deep North." In each case, distance from the Deep South is associated with a decline in pupil segregation, in the assignment of black teachers to black students, and in effective pupil discrimination.

The hypothesis that segregation and discrimination increase with the percentage of black students also gains support from these data (with the exception of the southern cities--these maintain a near maximum level of segregation even when their black population is small). Table 1B gives estimates of S, b, and D for northern cities (southern and southwestern cities excluded), classified according to the percentage of black students in the system. The measures of discrimination b and D rise with the proportion of black students. A somewhat weaker tendency for pupil segregation to rise at the same time is also observable.

A key to part of this correlation between discrimination and proportion of black students is found in column 5, which gives the ratio of the percentage of black teachers to percentage of black students for each category. There is a distinct tendency for city school systems with small proportions of blacks in their student populations to have still smaller proportions of black teachers on their staffs. Thus, the black teacher/black student ratio is positively correlated with the proportion of black students in the system. Since a large proportion of black teachers are usually assigned to black students, an increase in the black teacher/black student ratio will typically reduce the probability of a black student's having a white teacher.

However, this staffing policy does not explain all of the correlation between discrimination and proportion of black students. Column 4 gives a new measure, E, equal to b divided by the black teacher/black student ratio. It measures the percentage increase in the probability of getting a black teacher associated with a 1 percent increase in the proportion of black students in a class. E might be taken as a measure of discrimination, b, adjusted for variations in the black teacher/black student ratio, yet it is still positively related to the proportion of black students in the system.

Finally, column 5 gives the probability of a black student's getting a white teacher. As might be expected from the earlier results, this probability declines sharply as the proportion of black students in the system increases.

Conclusions

Inequality and discrimination are typically maintained in America's city school system by keeping poor and non-white students at least partially segregated, and then assigning the more experienced and more verbally able white teachers to schools attended by the less disadvantaged white children.

There is evidence that there is a strong regional dimension to this discrimination: effective discrimination rises more or less continuously as one approaches the South, where it reaches a maximum level of complete segregation of students, with all black students taught by black teachers and all white students taught by white teachers. There is also some evidence that racial integration in the schools is reduced in non-southern cities, as the percentage of black students, and especially of black teachers, increases. Black students then are more likely to be segregated and are less likely to be assigned white teachers.

Technical Note on the Relationship of Pupil Integration to Discrimination in Education

Studies of the variations in resource allocation among schools examine school or, at best, classroom discrimination: i.e., the extent to which classrooms having a high proportion of white or middle-class children are favored over others. Classroom discrimination, however, is not quite the same thing as "pupil discrimination," the favoring of white or middle-class children over other pupils.

Pupil discrimination depends upon classroom discrimination, but the extent to which classroom discrimination is successfully translated into pupil discrimination depends upon the degree to which classes are segregated along economic and racial lines. If there is no pupil segregation, so that each classroom represents a cross-section of the population, there can be no effective pupil discrimination, at least for resources that are allocated to the classroom as a whole.[1] If there are only minor departures from purposive integration, such as those which result if classes are drawn from a random sample of the population, then even rigid classroom discrimination will result in little effective pupil discrimination. If there is no pupil integration, and classes are completely homogeneous with respect to race and class, pupil and classroom discrimination will be the same.

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[1]Within-classroom pupil discrimination of a rather subtle nature also exists and can be quite important. Jonathan Kozol's study of an integrated Boston school, Death at an Early Age, shows how teachers can effectively discriminate against their Negro pupils, while favoring the whites.

In most Northern cities, there is an arrangement of pupils intermediate between complete segregation and complete integration. As the less-favored groups are mixed with the more favored, they benefit from the better facilities offered to the latter (and vice versa). The relationship between classroom and pupil discrimination when some classes are partly integrated can be explained most easily in the case of simple racial discrimination.

Discrimination against black children in the allocation of a specific educational resource, defined as the difference between the average amount of the resource received by a white and by a black child, can be expressed as follows: If S_j is the amount of the resource S allotted to the jth classroom; if $\hat{W}_j$ and $\hat{B}_j$ are the proportions of white and black children in that classroom; if $\hat{W}$ and $\hat{B}$ are the proportions of white and black children in the city schools; if m is the number of classrooms in the city; and D is the measure of pupil discrimination, then[1]

$$(1A) \quad D = \sum_{j=1}^{m} \frac{S_j}{m} \left(\frac{\hat{W}_j}{\hat{W}} - \frac{\hat{B}_j}{\hat{B}} \right).$$

Alternatively, given the fact that $W + B = 1$ and $W_j + B_j = 1$, we have

$$(1B) \quad D = \sum_{j=1}^{m} \frac{S_j \left(\frac{\hat{W}_j - \hat{W}}{m} \right)}{W(1 - \hat{W})}.$$

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[1]Abstracting from differences in classroom size, these equations show that pupil discrimination requires both segregation and calssroom discrimination. With complete integration, the proportion of whites in each classroom (W_j) will equal the proportion in the school system of the city (W). But if $W_j - W_S = 0$, then $D = 0$. Similarly, without classroom discrimination S_j is simply $\frac{S}{m}$, and

$$D = \frac{S_j}{m^2 W(1-W} \cdot \sum_{j=1}^{m} (\hat{W}_j - \hat{W}) = 0.$$

If classroom discrimination is of the linear type used in the empirical models employed in this study, so that[1]

$$(2) \quad S_j = a + bW_j,$$

than, substituting equation (2) into equation (1A) and combining terms, pupil discrimination is equal to

$$(3) \quad D = \frac{bn}{m} \sum_{j=1}^{m} \left[\frac{\hat{W}_j \hat{W}_j}{\hat{W}} - \frac{\hat{B}_j \hat{W}_j}{\hat{B}} \right]$$

(where n is classroom size). This is equivalent to stating that the measure of pupil discrimination, D, is equal to b, the coefficient of classroom discrimination, times the difference between the average number of white classmates a black child will have.

If the classroom discrimination function of equation (2) is substituted into equation (1B), and terms are combined, then pupil discrimination may also be written as

$$(4) \quad D = \frac{b \sigma^2_{W_j}}{\sigma^2_{W_j}},$$

or b times the ratio of the observed variance in the proportion of white

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[1] This linear model is consistent with the school administration's giving one weight to each white child and another, smaller weight to each black child in a class when allocating resources to the class. "b" is then proportionate to the difference between the weights given to the white children and those given the black children.

students in classrooms to the variance in this proportion which would be expected if classes were randomly selected from black and white students.[1]

If schools are completely and purposefully integrated, so that each classroom in the city has exactly the same proportion of whites, D = 0 because it is then impossible to effect pupil discrimination by means of classroom discrimination. If classes are chosen at random from the city's population, then there will be some small variation in the proportion of whites in classrooms, and D will have a value of b. If segregation is complete, D = bn.[2]

The more interesting case in which classes are partly integrated may best be understood through an example. Let there be a uniform distribution of black students in a municipal school system in which they constitute 50 percent of the students. If there are 93,000 school

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[1]For a discussion of other measures of segregation, see O. D. Duncan and B. Duncan, "A Methodological Analysis of Segregation Indexes," American Sociological Review, Vol. 20, (April, 1955); R. Farley and K. E. Raeuber, Science, Vol. 159, No. 3818 (March, 1968), pp. 953-956; and M. S. McDill, A. L. Stinchcombe and D. Walker, School Desegregation in Baltimore, (Baltimore: Center for the Study of the Social Organization of Schools, 1967).

[2]If the classes are drawn at random, then the observed variance in proportion white will (for a sufficiently large number of classrooms) equal the expected variance in the proportion, so that the ratio of the two variances will equal unity. Then D is simply b.

If there is complete segregation, then equation (3) would be written as:

$$D = \frac{bn}{m} \sum_{j=1}^{m} \left(\frac{1}{\hat{W}} - 0 \right) = bn.$$

children and 3,100 classrooms with an average class size of 30, a uniform distribution requires that there be 100 classrooms with no blacks, 100 with 1 black, and so forth up to 100 with 30 blacks.[1]

The ratio of the observed to expected variance in the proportion of blacks in a classroom would, with this degree of segregation, equal .0888/.00833 or 10-2/3.

If the school administration gives twice as much weight to a white as to a black child,[2] in allocating a resource (e.g., supplementary textbooks), and if there is $86,000 of the resource available to the school system, the classroom discrimination function will be $S_j = 30 + 4/3\ W_j$, where S_j is expressed in dollars. Thus, the value of books assigned to a class will range from $40 to $80, depending on the number of white students it contains. With a uniform distribution, the average white child will be in a class with 20-1/3 whites; the average black child will have 9-2/3 white classmates. Hence, the average white will be in a class that receives $67.11 worth of books, the average black ir a class that received $52.89. The effective pupil discrimination in this resource

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[1] A uniform distribution is, of course, very different from an equal distribution. For example, a uniform distribution of the national income might give 1 million people zero income, 1 million people $1,000 a year a piece, 1 million $2,000 a year a piece, etc., up to, say, a maximum of 1 million people with $10,000 a year a piece. An equal distribution would give every person $5,000 a year.

[2] Conscious discrimination is assumed in this example for the sake of simplicity. As was shown above, the reality is far more complex.

is then \$14.22. This is also confirmed by a direct calculation of the measure of pupil discrimination:

$$D = b \cdot \frac{\text{observed variance}}{\text{expected variance}} = \frac{4}{3} \times 10\frac{2}{3} = 14.22.$$

If the same classroom discrimination function is used without any pupil integration, D = \$40. Each white class receives \$80 worth of books and each black class \$40. Thus, the partial integration of students assumed in the example reduces the ratio of resources allotted to whites to those allotted to blacks from 2:1 to about 5:4.[1]

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[1] However, it may not be feasible for the administrator to restore the higher ratio simply by increasing the level of classroom discrimination. In the present example, this would require weighting each white student as equal to 7-3/8 black students. But in this partially integrated situation, such an increase would have the undesired side-effect of also increasing radically the gap between segregated whites and whites in integrated classes.

This problem will be reduced insofar as it is lower income whites who are integrated with (relatively) higher income blacks. If income as well as race enter the weighting function, this type of integration is apt to decrease the gap between actual and desired level of pupil discrimination.

Another restraint on the administrator may arise if there are diminishing educational returns to the resource input, S. Then, even apart from considerations of equity among whites, efficiency in the education of whites would prevent him from concentrating all of the resources on the all-white, or nearly all-white, classes. In fact, it can be shown that if diminishing returns take the form of a relationship between the amount of resources in a class, S_j, and the learning of the ith student in the jth class $L_{ij} = \log (bS_j)$, the most efficient way of allocating resources among white students will be to distribute them in proportion to the number of white students in a class.